FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

U.S. Department of Energy

Office of Electricity Delivery and Energy Reliability

COOPERATIVE RESEARCH AND DEVELOPMENT

For

ELECTRIC TRANSMISSION AND DISTRIBUTION

Funding Opportunity Number: NO. DE-PS02-05CH11270

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Information regarding this announcement is available on the Department of Energy, Industry Interactive Procurement System (IIPS) Web site at: http://e-center.doe.gov.

NOTE: NEW REQUIREMENTS FOR GRANTS.GOV

Where to Submit: Applications must be submitted through Grants.gov to be considered for award.

Registration Requirements: There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider and register with Grants.gov). See www.grants.gov/GetStarted. Use the Grants.gov Organization Registration Checklist at http://www.grants.gov/assets/OrganizationRegCheck.doc to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 14 days to complete these requirements. It is suggested that the process be started as soon as possible. (See PART IV.H, OTHER SUBMISSION AND REGISTRATION REQUIREMENTS)

VERY IMPORTANT – Download PureEdge Viewer: In order to download the application package, you will need to install PureEdge Viewer. This small, free program will allow you to access, complete, and submit applications electronically and securely. For a free version of the software, visit the following web site: http://www.grants.gov/DownloadViewer.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

A. SUMMARY

The Department of Energy (DOE), Chicago Office, is seeking applications on behalf of the DOE Office of Electricity Delivery and Energy Reliability (OEDER) to respond to the topic areas defined herein. The OEDER was newly named in 2005 after the DOE Office of Energy Assurance merged with the DOE Office of Electric Transmission and Distribution (OETD).

The topic areas of this announcement address key technical challenges and high-priority activities identified in two Multi-Year Plans for three of the operating programs within the OEDER, namely, Electric Distribution Transformation (EDT) Program, GridWise Program, and GridWorks Program. The EDT Program and GridWise Program have jointly developed the *Electric Distribution Multi-Year Research, Development, Demonstration, and Deployment (RD^3) Technology Roadmap Plan: 2005-2009* (December 2004); http://www.electricdistribution.ctc.com/pdfs/MYRD_ElecDist_11-3_rv9.pdf
and the GridWorks Program has developed its *GridWorks Multi-Year Plan,* March 2005. http://www.energetics.com/gridworks/events.html

Both the Electric Distribution Multi-Year Plan and the GridWorks Multi-Year Plan were developed with significant input and contributions from a broad stakeholder group, with representatives from utilities, load serving entities, technology providers, universities, national laboratories, and government agencies. The Plans further define specific activities with milestones to address several critical technology areas outlined in the *National Electric Delivery Technologies Roadmap* (November 2003). The critical technology area addressed by the Electric Distribution RD^3 Plan is primarily on "Distributed Sensors, Intelligence, Smart Controls, and Distributed Energy Resources"; and the GridWorks Plan addresses key aspects of the critical technologies on "Advanced Conductors" and "Power Electronics."

Thus this announcement seeks to support implementation of the Multi-Year Plans of the combined EDT/GridWise Programs (hereafter referred to as electric distribution R&D) and the GridWorks Program by addressing identified technology gap areas in the respective Plans which are of the utmost technical and programmatic significance.

B. BACKGROUND INFORMATION

The mission of the OEDER is to lead a national effort to help modernize and expand America's electric delivery system to ensure economic and national security. The former OETD was established in August 2003, in response to the recommendation of the National Transmission Grid Study. The OETD began with four Research and Development (R&D) program areas in High Temperature Superconductivity, Transmission Reliability, Distribution and Integration, and Energy Storage, all of which operated previously within the DOE Office of Energy Efficiency and Renewable Energy (EERE). Later, in FY 2005, two new, additional Programs were launched by the OEDER, i.e., GridWise and GridWorks. Collectively, these R&D Programs undertake major electric transmission and distribution R&D efforts, including integration of advanced technologies in superconductivity, energy storage, and distributed energy

resources (DER) into the transmission and distribution grid for enhanced reliability, efficiency, and security.

In regard to electric distribution R&D, the activities are primarily conducted under the sponsorship and management of the EDT Program and the GridWise Program. The overall scope of the electric distribution R&D is to modernize our electric distribution infrastructure and operations through applications of advanced communications, information, and sensors and controls throughout the distribution network, reaching from distribution substations (69 kV and below) to electricity end users (commercial/industrial/residential) and includes the integration of Distributed Resources. The modernization will allow two-way flow of information and electricity for broad participation and penetration of demand/load management, and will include distributed intelligence throughout key strategic locations to respond to local contingencies and to provide a coordinated response to the effected distribution network. Additionally, distribution operations will be automated not only to predict and respond to any power disturbance/outage events, for enhanced reliability and security, but also to achieve efficiency and cost-effectiveness of electric distribution operations.

The EDT and GridWise Programs complement and complete the scope of the electric distribution R&D. Hence, the two Programs jointly developed the *Electric Distribution Multi-Year RD^3 Technology Roadmap Plan* to address all aspects of technology needs to modernize electric distribution. The needs and specific RD^3 activities defined in the Plan have resulted from a consensus building process engaging broad stakeholder representatives, from initial planning for the workshop through conduct of the workshop, and through final review and concurrence on the Electric Distribution Multi-Year Plan.

In regard to GridWorks, the Program was created to develop advanced hardware technologies crosscutting applications in electric transmission and distribution systems. The GridWorks Program focuses on modernizing the key grid components: cables and conductors, substations and protective systems, and power electronics. The Program engaged more than 160 experts and practitioners, through its planning workshop and webcasts, and developed the GridWorks Multi-Year Plan. The GridWorks Plan identifies technical barriers, determines the most important needs, and set priorities and goals for these needs. The GridWorks Program will address the identified needs by issuing competitive industry solicitations (including this one) and laboratory calls, as well as conducting information and technical exchanges to share lessons learned.

Thus, the Multi-Year Plans for the electric distribution R&D and the GridWorks Program guide technology development pathways for the ETD/GridWise/GridWorks Programs and serve as the basis for the topic areas under this announcement.

C. OBJECTIVES

The overarching objective of this announcement is to implement select high-priority RD^3 activities described in the Electric Distribution and GridWorks Multi-Year Plans and further summarized in the Topic Areas.

Performance objectives for each of the six topic areas will include the overall improvement and enhancement of the following characteristics of grid modernization: reliability, security, efficiency, and cost-effectiveness resulting from implementation of the proposed technology solutions. Under the context of this announcement these

characteristics are defined as follows:

Reliability:	A measure to take into account any power disturbance events, including power outages and occurrences of deviations of power quality from user requirements.
Security:	A measure to reflect the robustness, resilience, and responsiveness of electric infrastructure and components against natural and man-made attacks affecting both physical and data/information security.
Efficiency:	A measure to reflect maximizing the use of all available assets, including distributed generation and managing loads as resources for the overall efficiency of electric distribution operations. Also, for GridWorks technologies, a measure to reflect increased power densities and decreased energy losses of materials/equipment.
Cost-effectiveness:	A measure to reflect increased cost affordability of grid components/equipment, as well as customer decision-making on electricity usage, based on market pricing (e.g., demand responsiveness).

Each application must meet the overarching objectives and must address qualitative and quantitative aspects of improvement and enhancement of the above performance characteristics, as well as any additional objectives, in the descriptions of the respective Scope of Work topic areas.

D. TOPIC AREAS

The announcement includes six topic areas: four topic areas, #1-4, addressing the electric distribution R&D; and two topic areas, #5-6, addressing the GridWorks. Each application must address a specific topic area described below. If applicants wish to submit an application for more than one topic area, separate applications are required. Please note that an application that responds to more than a single topic area will be rejected.

Electric Distribution R&D (Topic Areas 1-4)

Topic Area 1: Demonstration of Advanced Distribution Operations/Automation with Distributed Energy Resource (DER) Integration

This topic area primarily addresses the following RD^3 activity needs described in the Electric Distribution Multi-Year Plan:

- 2.3.1.3, DER Integration
- 2.3.1.4, Meeting Customer Power Quality Requirements
- 2.3.1.5, Advanced Operating Strategies
- 2.2.1.1, Demonstrations of Load-Management Technologies and Practices
- 2.4.1.4, Modeling New and Existing DER Technologies on the Distribution System

DER technologies (including distributed generation, demand response, and energy storage) are deemed to have increasing significance to distribution operations, as their efficiencies and costs continue to improve. Today, most distributed generation assets have dedicated use under emergency and back-up services, not interconnected to the utility electric power system; further, the utility Supervisory Control and Data Acquisition **(**SCADA) and other grid-recognition systems are configured to recognize and control typical utility assets, not demand-side assets. Thus, the potential value of DER to support distribution operations/automation is under-realized, and, even more significantly, customer loads, generation, and storage are not managed and operated to benefit the distribution grid.

This topic area seeks to demonstrate DER integration with real distribution substation(s) to directly contribute to each and every one of the following key aspects of advanced distribution operations/automation.

Managing limited capacity on substations/feeders. Each application must demonstrate the value of distributed generation (existing and new, utility- and customer-owned assets) and/or demand response in relieving congested substations and feeders, targeting avoidance of >15% of the total circuit peak load. It is also required that all DER technologies proposed for use in the demonstration be integrated with the utility SCADA system and Energy Management System.

Voltage/Volts - Amps - Reactive(VAR) management. All DER technologies, when integrated with substations/feeders, must be demonstrated to be capable of operating in coordination with other distribution equipment (voltage controllers, power electronic devices, capacitor banks, etc.) to provide concerted voltage and Volt-Amps-Reactive (VAR) management under normal and emergency conditions. Low-cost and high-performance power conversion-based DER interface technologies and application strategies are needed to support voltage/VAR management on the distribution system operation.

Intentional islanding. Each application must incorporate DER integration as an integral part of its distribution system protective strategies. The demonstration must show that DER integration enables distribution automation to allow part of the distribution system to be reconfigured automatically and to operate as intentional islands for uninterruptible power services. The reconfiguration, triggered by overloads (either of substation transformers or of segments of distribution circuit), will also provide an optimal switching order to control switching devices for rapid distribution service restoration to faulted sections.

In addition to the required contributions to advanced distribution operations/automation above, each application must also address the following technology gap areas:

- Development of control algorithms for autonomous DER operations that address multiple DER interactions and stability issues
- Understanding of DER penetration limits on the demonstrating substation/feeder
- Coordination and interoperability of multiple DER technologies with multiple applications/customers

An integrated team (see PART III, A., Eligible Applicants) responding to topic area #1 must include an electric distribution utility.

Topic Area 2: Demonstration of Smart Appliances for Load Management

This topic area primarily addresses two RD^3 activity needs described in the Electric Distribution Multi-Year Plan: 2.2.1.2, Smart Appliances and 2.2.1.1, Demonstrations of Load Management Technologies and Practices.

Customer-side loads are viewed as potentially valuable resources to help balance electricity demand/supply conditions during peak-demand periods and to help provide rapid recovery during voltage-collapse periods. Today, residential use of electricity amounts to about one third of total electricity used in the nation, a significant part of which is attributed to electricity used by household appliances. If a large number of these appliances can be automated for a concerted response to shed loads under grid disturbance events (i.e., under-frequency and under-voltage conditions), this would provide the utility with an additional means to control and manage grid operations.

A limited pilot-scale demonstration to control operations of a small group of water heaters and dryers in ~200 homes in response to under-frequency events is being planned in the Northwest region, involving one manufacturer's dryers and custom-modified water heaters. This topic area intends to broaden the scale of demonstration by including participation of many appliances (air conditioners, water heaters, space heaters, refrigerators, washers and dryers, dishwashers, ranges, etc.) from many manufacturers, all of which will ideally respond to a universal controller for autonomous under-frequency and under-voltage load shedding.

Specifically, this topic area solicits applications to demonstrate, on a scale of 500+ homes, autonomous control of a number of the above-mentioned appliances from different manufacturers for: under-frequency and under-voltage load shedding; delayed restart after voltage-collapse events; and economic dispatch operations based on price signals and/or curtailment programs. A universal controller is preferably sought for use in each household to autonomously control all of its appliances. The autonomous control functions will include: sensing controlling events (under-frequency, under-voltage, economic dispatch); communicating with many appliances from many manufacturers in a household to set forth autonomous control responses; and monitoring these responses and communicating them to grid operators or load serving entities. The built-in control responses in each appliance from each manufacturer can be different, based on perceived customer acceptance of autonomous modes of operations. Each application must describe individual features of autonomous modes of operations for each appliance, as well as provide the add-on unit cost for such built-in response mode functions (assuming a manufacturing scale of 100,000 appliances per year).

Either an electric distribution utility, an appliance manufacturer, a load serving entity, or a home developer (customer of smart appliances) is eligible to serve as the applicant for an integrated team (see PART III. A., Eligible Applicants) responding to topic area #2. It is strongly preferred that an integrated team consists of a group of appliance manufacturers to cover the entire suite of electric appliances in a typical household.

Topic Area 3: Fault Locating, Prediction, and Protection

This topic area primarily addresses four RD^3 activity needs described in the Electric Distribution Multi-Year Plan: 2.3.1.2, Fault Locating, Prediction, and Protection; 2.2.1.4, Signature Library,

Analytical Tools, and Signature Recognition Applications; 2.2.1.5, Develop Infrastructure and Requirements for Integration of Monitoring Information; and 2.2.1.3, Next-Generation Low-Cost Sensors.

This topic area focuses on the overall system to predict, detect, and locate incipient and actual faults on distribution systems (at the substation or out on the line). This fault locating/prediction/protection system will consist of sensors to monitor voltage and current to be coupled/transmitted to intelligent electronic devices that can in turn operate sectionalizing devices to isolate the faulted portions of distribution feeders. The system will also need to interface with the outage management system and provide recommended procedures for restoration of power delivery services.

The requirements for the fault locating/prediction/protection system sought under this announcement must enable all functions listed below. Each application is required to describe the system's performance of these individual functions:

- Compatible with industry standards
- Integration with existing electronic controls, devices, or relays
- Sensors that capture current and voltage signals without distortion
- Time synchronized phase angles
- Compatible with existing switching equipment
- Recognition of direction of current (for distributed resources on circuit or network)
- Capture waveform
- Signature recognition for prediction of imminent equipment failure, including development and application of signature library and advanced recognition algorithms to correlate monitored signals and associated equipment conditions

Each application shall conclude with pilot installation of the fault locating/prediction/protection system at a distribution utility to monitor distribution feeder line operations and shall complete a minimum of three months of monitoring data collection.

It is preferred (not required) that an electric distribution utility serves as the applicant for an integrated team (see PART III. A., Eligible Applicants) responding to topic area #3.

Topic Area 4: Microgrid Technology Development and Demonstration

This topic area primarily addresses three RD^3 activity needs described in the Electric Distribution Multi-Year Plan: 2.3.1.5, Advanced Operating Strategies; 2.3.1.4, Meeting Customer Power Quality Requirements; and 2.3.1.3, DER Integration.

This topic area solicits development and demonstration of microgrid designs to enable advanced distribution system operations, such as in performing intentional islanding, meeting differentiated power quality requirements for different customers, etc. A microgrid in this context is defined as at least one distributed resource that is capable of operating either in parallel with

or independent from an electric power system while providing continuous power to multiple loads on the electric power system. Typical microgrid applications involve aggregation of distributed generation and customer loads (residential/commercial/industrial), which is designed to be dispatchable during peak-demand periods and to provide uninterruptible services to the loads during power disturbance events.

Currently, the microgrid concept is in limited practice and most existing microgrids are custom designed. Further development, testing, and demonstration of microgrid designs are needed to better understand their operations and integration with electric power systems.

Specifically, this topic area solicits applications to develop and demonstrate microgrid designs capable of either autonomous or semi-autonomous switches, between grid-connected and islanding modes of operations, based on area electric power system conditions. Additionally, the business case for microgrid operations must be established, through economic dispatch responsive to pricing signals and demand management programs, customer willingness to pay premiums for increased power reliability and quality, etc.

An integrated team approach (see PART III. A., Eligible Applicants) is required. Either an electric distribution utility, a load serving entity, a technology product provider, or a technology developer is eligible to serve as an applicant responding to topic area #4.

GridWorks (Topic Areas 5-6)

Topic Area 5: Cables and Conductors

There is a need to increase the electric capacity of existing transmission corridors, either by upgrading existing lines or through the development of advanced cables and conductors that can operate at higher temperatures and with less sag. In addition, built-in sensors can improve capacity utilization by detecting and communicating problems before they result in system disturbances or outages.

This topic area primarily addresses the need for advanced conductor research called out in the *National Electric Delivery Technologies Roadmap*. Applications are encouraged to be submitted that meet the objectives of either (or both) of the following two tasks.

a) Demonstrate high temperature-low sag (HTLS) conductor(s)

The focus of this task is to work with the electric power industry to accelerate the field testing and market application of HTLS conductors in order to enhance existing transmission networks. The advantage of these technologies is their ability to greatly increase the capacity of existing transmission corridors right of ways (ROWs) thus avoiding many of the issues related to the inability to build new transmission lines. Subtasks could include, but are not limited to, the following:

- *Study/analyze electrical characteristics of HTLS conductors* - Many of the advanced conductors need field performance data aluminum conductor steel reinforced (ACSR benchmarking) before they can be accepted.
- *Update performance requirements (scenarios) to reflect operating realities of today's restructured power systems and increased load intensities of customer facilities* – More detailed monitoring and data collection may reestablish the baseline against which advanced conductors are compared.
- *Perform accelerated thermal/mechanical life testing* – Accelerated testing could indicate weaknesses in capability or strength of HTLS conductors.
- *Generate acceptable installation practices and test protocol* – Development of an application guide/methodology for HTLS conductor installation (that could be used by both utilities and State regulators) could accelerate the industry's ability and willingness to deploy the technology.

b) Conduct materials research to cost-effectively increase the transmission corridor power density

The focus of this task is to conduct materials research needed to cost-effectively increase overhead transmission capacity. From a materials standpoint, an advanced power transmission network would consist of overhead conductors with the conductivity of high purity copper, the weight of aluminum, the strength of hardened steel, and minimal conductor sag. Thus, properties that need to be optimized include specific conductivity, elastic (Young's) modulus, yield and ultimate tensile strengths, creep rate (temperature tolerance), and fatigue strength. In addition, the new materials system would have to exhibit a minimal coefficient of thermal expansion (CTE), excellent corrosion resistance, high emissivity (to increase heat transfer/cooling), and an increased tolerance to short circuit currents. This network would also consist of sensors and monitoring regimes to enable real-time rating of installed overhead transmission lines in critical corridors. This system must also have a very high performance to cost ratio and exhibit other benefits at least comparable to current technologies.

At the GridWorks workshop, industry stakeholders identified a "stretch goal" of achieving power densities for conductor systems of 50 times ACSR by 2025. Applicants must discuss the extent to which their proposed research can contribute to this goal. Issues associated with the maintenance of overhead transmission lines (including insulators and surge arresters) in light of the aging grid system and high costs with new construction and maintenance will also be considered.

<u>Topic Area 6: Substations and Protective Systems</u>

There is a need to expand the functionality and improve the performance of electric substations and protective systems. Improved operational and diagnostic support tools can strengthen asset management. Power electronics devices, acting as grid "shock absorbers", could respond better to large power oscillations and achieve better fault current management. Advanced materials could yield devices, such as solid-state transformers, with the capability for high voltage, high frequency, high current, and high power density operations, with little or no cooling requirements and a favorable cost-to-value relationship. Better transformers and fault current limiters would improve reliability and asset utilization.

Applications are encouraged to be submitted that contribute to the objectives of either (or both) of the following two tasks.

a) Develop “next-generation” transmission transformers

Transmission transformers, located at generating stations and substations, are big, overused, and expensive. Smaller, lighter, cost-effective, environmentally friendly transformers are needed to lower costs and improve the reliability of the electric delivery system. In addition, when a transformer does fail, locating and transporting a replacement transformer may be very difficult. If a suitable replacement transformer can not be found, constructing a new transformer can require 6 to 18 months, depending on the size mega volts amperes (MVA) and voltage. Thus, a transformer that can operate efficiently and effectively in a variety of applications (e.g. modularization to ease transportation and reduce spare requirements), but that does not sacrifice operational characteristics (i.e. long design life; fails open/high; overloadable without loss of life) would be beneficial.

The focus of this task is to conduct research that can contribute to the “next generation” of transmission transformers. Subtasks could include, but are not limited to, the following:

- Improved materials, such as higher saturation flux density core steel, high-temperature insulating materials, improved dielectrics, and power electronics
- Development of nonflammable oils and self-healing tanks, as well as affordable composites, ceramics, or armor materials that can shield or protect the transformers
- Embedded sensors and diagnostic support tools to identify developing or incipient problems
- Improved manufacturing methods to reduce cost and time to delivery

b) Develop and/or demonstrate cost-effective fault current limiters for the transmission system

There is a need for cost-effective fault current limiters to avoid replacing underrated equipment, improve overall power quality, and easily integrate new generation equipment with the current system. Fault current limiters can help protect other devices from near faults, reduce the impact of faults that are felt throughout the system, and enable open access to the system for energy storage and distributed generation devices.

The focus of this task is to conduct research that can contribute to cost-effective fault current limiters for the transmission system. Applicants should address response time, energy absorption, and reset/recovery time.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding cooperative agreements under this Financial Assistance Opportunity Announcement (See PART VI.B.3, Statement of Substantial Involvement).

B. ESTIMATED FUNDING

The following funding amounts are expected to be available for new awards for each of the topic areas under this announcement:

Topic Area	**Available DOE Funding (over the total period of performance of all projects awarded)**
1: Demonstration of Advanced Distribution Operations/Automation with DER Integration	$4.5 million - $5 million
2: Demonstration of Smart Appliances for Load Management	$3.5 million - $4 million
3: Fault Locating, Prediction, and Protection	$0.8 million - $1 million
4: Microgrid Technology Development and Demonstration	$0.8 million - $2 million
5: Cables and Conductors	$3 million - $4 million
6: Substations and Protective Systems	$3 million - $4 million

C. MAXIMUM AWARD SIZE

The following ceilings (i.e., the maximum amount for an individual award made under this announcement) for the DOE funding share are expected:

Topic Area	**Individual Award Ceilings for DOE Funds (over the total period of performance)**
1: Demonstration of Advanced Distribution Operations/Automation with DER Integration	$2.5 million
2: Demonstration of Smart Appliances for Load Management	$2 million
3: Fault Locating, Prediction, and Protection	$1 million
4: Microgrid Technology Development and Demonstration	$2 million
5: Cables and Conductors	$2 million
6: Substations and Protective Systems	$2 million

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making the following number of awards under this announcement:

Topic Area	Approximate Number of Awards
1: Demonstration of Advanced Distribution Operations/Automation with DER Integration	2
2: Demonstration of Smart Appliances for Load Management	2
3: Fault Locating, Prediction, and Protection	1
4: Microgrid Technology Development and Demonstration	1
5: Cables and Conductors	2
6: Substations and Protective Systems	2

The Government reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this announcement and will award that number of financial assistance instruments which serves the public purpose and is in the best interest of the Government. Additionally, project continuation into out-years will be subject to available program funding and a number of project performance factors, including (but not limited to) technical progress, project management, and continuing contribution to the OEDER goals and objectives. The project annual review results will be used as a basis for the decision on project performance factors.

E. ANTICIPATED AWARD SIZE

DOE anticipates that individual awards will be in the following dollar range for the total project period:

Topic Area	Approximate DOE Share of Each Award
1: Demonstration of Advanced Distribution Operations/Automation with DER Integration	$2 million - $2.5 million
2: Demonstration of Smart Appliances for Load Management	$1.5 million - $2 million
3: Fault Locating, Prediction, and Protection	$0.8 million - $1 million
4: Microgrid Technology Development and Demonstration	$0.8 million - $2 million
5: Cables and Conductors	$1.5 million - $2 million
6: Substations and Protective Systems	$1.5 million - $2 million

F. PERIOD OF PERFORMANCE

DOE anticipates making awards that will run for the time periods indicated below. Awards will have project and budget periods that are specific to the project and available funding.

Topic Area	**Anticipated Total Project Period of Performance**
1: Demonstration of Advanced Distribution Operations/Automation with DER Integration	36 Months
2: Demonstration of Smart Appliances for Load Management	36 Months
3: Fault Locating, Prediction, and Protection	24-36 Months
4: Microgrid Technology Development and Demonstration	24-36 Months
5: Cables and Conductors	36 Months
6: Substations and Protective Systems	36 Months

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

All types of applicants are eligible to apply, except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

Applicants responding to this announcement are expected to employ an integrated team approach, involving a variety of team members including, but not limited to, electric utility companies, load serving entities, technology product providers, technology developers (universities, research organizations), state energy agencies, energy users (customers), and home developers (applicable to topic area #2 only). The applicant will be the prime recipient of any award made as a result of an application under this announcement. The remaining team members will be subrecipients.

Additional descriptions of the teaming/applicant requirements are provided in the individual topic area descriptions. Teaming will be evaluated in accordance with the Evaluation Criteria established in this announcement.

B. COST SHARING

In accordance with the requirements of Section 3002 of the Energy Policy Act of 1992, applicants are required to cost share the following minimum percentages:

For research, development, & pilot-scale testing
The cost share must be at least 20% of the total allowable costs for research and development projects (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources. (See 10 CFR part 600 for the applicable cost sharing requirements.)

For full-scale demonstration/beta-site testing
The cost share must be at least 50% of the total allowable costs for demonstration and commercial application projects (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources. (See 10 CFR part 600 for the applicable cost sharing requirements.)

C. OTHER ELIGIBILITY REQUIREMENTS

1. Participation by Federally Funded Research and Development Center Contractors.
Federally Funded Research and Development Center (FFRDC) contractors are not eligible for an award under this announcement, but they may be proposed as a team member subject to not more than 50% of the total cost of all work to be performed.

Applications submitted directly by a FFRDC, or that involve the FFRDC participation in excess of the amount allowable, will not be considered for award.

The contractual arrangement between the recipient and the FFRDC may be a Cooperative Research and Development Agreement (CRADA) or other agreement, to be negotiated between the laboratory and the recipient of a cooperative agreement awarded as a result of this announcement. In any event, DOE shall pay for the laboratory's portion of the work directly and not through the recipient. (It should be noted that the total value of this solicitation will be reduced by the amount of funding sent directly to the FFRDC.)

A Letter of Commitment from an authorized representative of the FFRDC, confirming the laboratory's agreement to participate in the manner described in the application, must be submitted with the application. Additionally, approval by the cognizant Contracting Officer for the Laboratory Management and Operating contract must be submitted with the application.

2. Energy Policy Act Eligibility Requirements. Section 2306 of the Energy Policy Act of 1992 (EPACT) [42 U.S.C. 13525] imposes certain eligibility requirements on awards made under this program. In order to make an award to an applicant that is a business entity, other than a non-profit organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954, DOE must determine that the applicant's participation will be in the economic interest of the United States and that the applicant is either a U.S. owned company or is incorporated or organized under the laws of any State and that its parent company is incorporated or organized under the laws of a country that affords: (1) to U.S. owned companies opportunities comparable to those afforded to any other company to participate in government-supported joint ventures in energy research and development and in local investment opportunities; and (2) adequate and effective protection for intellectual property rights of the U. S. owned companies. Eligible applicants must be able to meet these two tests. (See part IV. D., Submissions From Successful Applicants, for submission of EPAct Representation.)

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

The application package is available at Grants.gov. To access the package, go to http://www.grants.gov, select "Apply for Grants," and then select "Download Application Package." Enter the CFDA and/or the funding opportunity number located on the cover of this announcement. Select "Download Application Package," and then follow the prompts. NOTE: You will not be able to download the Application Package unless you have installed PureEdge Viewer.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent.

Letters of Intent are not required.

2. Pre-application.

Pre-applications are not required.

C. CONTENT AND FORM OF APPLICATION – SF 424 (R&R)

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) in accordance with the pop-up instructions on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) or MS Word unless otherwise specified in this announcement.

1. SF 424 (R&R).
Complete this form first to populate data in other forms. Complete all required fields in accordance with the pop-up instructions. To activate the pop-up instructions, turn on the "Help Mode" (icon with the pointer and question mark). The list of certifications and assurances referenced in Block 18 can be found at http://grants.pr.doe.gov.

2. RESEARCH AND RELATED Project/Performance Site Location(s). Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site(s).

3. RESEARCH AND RELATED Other Project Information.
Complete questions 1 through 5 and attach files in blocks 6-11, as necessary. The attached files must provide the information specified in the pop-up instructions and the following additional instructions:

Block 6 - Project Summary/Abstract
The project summary/abstract must contain a summary of the proposed activity suitable for publication. It should be a self-contained document that identifies the name of the applicant, the principal investigator/project director, the project title, the objectives of the project, methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This

document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) with font not smaller than 11 point.

Block 7 - Project Narrative
The project narrative must not exceed 20 pages, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right). EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed.

The project narrative must include:

- Project Objectives. This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

- Merit Review Criterion Discussion. The section should be formatted to address each of the merit review criterion and sub-criterion listed in Section V. A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.

- Evaluation Phase: This section must include a plan and metrics to be used to assess the success of the project

Blocks 8, 9, and 10 - Bibliography & References Cited; Facilities & Other Resources; and Equipment.
If applicable, provide the information requested in the application instructions and attach each file in the appropriate block.

Block 11 - Other Attachments:
If you need to elaborate on your responses to questions 1-5 on the "Other Project Information" document, attach a file in block 11. Also, attach the following files:

Cost Sharing Files (See PART IV C. 5., Research and Related Budget)

4. RESEARCH AND RELATED Senior/Key Person
Complete the required profile information for each senior/key person proposed. A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project, whether or not a salary is proposed for this individual. Consultants should be included if they meet this definition. For each senior/key person provide:

Biographical Sketch.
Complete a biographical sketch for each senior/key person and attach in the block provided. The biographical information for each person must not exceed 2 pages

when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

Education and Training Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

Research and Professional Experience Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities List no more than 5 professional and scholarly activities related to the effort proposed.

Current and Pending Support

Provide a list of all current and pending support for the Principal Investigator (PI) and each senior/key person for ongoing projects and pending applications. Show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by senior/key person, regardless of source of support. Attach this list in the block provided.

5. RESEARCH AND RELATED BUDGET.

Complete the Research and Related Budget form in accordance with the pop-up instructions on the form and the following instructions. The R&R budget form allows you to complete up to five separate budget years. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work and are not precluded by the cost principles or the funding restrictions in this announcement (See PART IV, G, Funding Restrictions). In accordance with the EPAct cost sharing requirement, DOE intends to fund, based on availability of funds, up to 80% of the allowable project costs for research and development projects and up to 50% of the allowable project costs for demonstration and commercial application projects.

Cost Sharing Files. In addition to including cost share in the above R&R Budget, provide separate budgets as instructed below. (See 10 CFR part 600 for the applicable cost sharing requirements. It should be noted that cost sharing funds cannot be paid by the Federal Government under another award except where authorized by Federal statute. Also, funds from any other federally-assisted project or program are not to be included as cost share contributions.)

Third Parties Contributing to Cost Sharing

If a third party, (i.e., a party other than the organization submitting the application) proposes to provide all or part of the required cost sharing, the applicant must include a letter from each third party stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing (e.g., cash, services, and/or property) to be contributed and be accompanied by an R&R budget for each budget period showing the breakdown of the cost share by cost element. An explanation which supports each cost element of the cost share must be included with the budgets. These requirements apply for any amount of cost sharing. Letters must be signed by the person authorized to commit the expenditure of funds by the entity and be provided in a PDF format. Label each cost sharing contributor's file with a unique file name of not more than 25 letters, preferably using the contributor's company name or some recognizable derivative and attach to Block 11 – Other Attachments on the Research and Related Other Project Information Form. (It should be noted that the applicant will be held responsible for the performance of the third party cost share contributor in the event of nonperformance by the third party cost share contributor.)

Applicants Contributing to Cost Sharing

If the applicant proposes to provide all or part of the required cost sharing, the applicant must include a letter stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing (e.g., cash, services, and/or property) to be contributed and be accompanied by an R&R budget for each budget period showing the breakdown of the cost share by cost element. An explanation which supports each cost element of the cost share must be included with the budgets. These requirements apply for any amount of cost sharing. Letters must be signed by the person authorized to commit the expenditure of funds by the entity and be provided in a PDF format. Label each cost sharing contributor's file with a unique file name of not more than 25 letters, preferably using the contributor's company name or some recognizable derivative and attach to Block 11 – Other Attachments on the Research and Related Other Project Information Form.

Block K - Budget Justification

Provide the required supporting information (See R&R Budget pop-up instructions) for the following costs: equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. Attach the budget justification file in Block K on the R&R Budget form.

Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Contractor, if applicable If a DOE/NNSA FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal (MS Word form) in accordance with the requirements in DOE Order 412.1 Work Authorization System. This order and the DOE Field Work Proposal form are available at http://grants.pr.doe.gov. Use the FFRDC name as the file name (up to 10 letters)

and attach to the R&R Other Project Information form in Block 11 – Other Attachments.

6. **R&R SUBAWARD BUDGET ATTACHMENT(S) FORM**
Budgets for Subawardees, other than DOE FFRDC Contractors. You must provide a separate R&R budget for each subawardee that is expected to perform work estimated to be more than $100,000 or 50 percent of the total work effort (whichever is less). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET ATTACHMENT(S) FORM and e-mail it to each subawardee that is required to submit a separate budget to complete. Note: Subwardees must have installed PureEdge Viewer before they can complete the form. After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Important: Use the subawardee's organizational name (up to 10 letters) as the file name.

7. **SF-LLL DISCLOSURE OF LOBBYING ACTIVITIES** If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

1. Successful applicants must submit the information listed below not later than 15 calendars days after notification of selection. Applicants who fail to provide the information within the required time period may be eliminated from further consideration.

What to submit	Required Form or Format
Designated Responsible Employee for complying with national policies prohibiting discrimination. Provide organization name, project title, DOE application tracking number and the name, title, and phone number of Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5).	No special format. E-mail information to: michael.rafa@ch.doe.gov
EPACT Representation. This program is covered under Title XX through XXIII of the Energy Policy Act (EPACT) of 1992. If an applicant is a business entity other than an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954, the applicant must provide an EPACT Representation.	EPACT Representation form at http://grants.pr.doe.gov. E-mail information to: michael.rafa@ch.doe.gov or fax to 630/252-5045

501(c)(3) organizations, State, local, and tribal governments do not need to complete this form.	
Environmental Questionnaire. You must complete and submit an environmental questionnaire.	This form is available at http://www.ch.doe.gov/offices/ACQ/docs/ E-mail information to: michael.rafa@ch.doe.gov or fax to 630/252-5045

2. The DOE anticipates that no additional submissions will be required. However, it reserves the right to request additional or clarifying information for any reason deemed necessary.

E. SUBMISSION DATES AND TIMES

1. Pre-application Due Date.
Pre-applications are not required.

2. Application Due Date.

Applications must be received by July 8, 2005, no later than 8:00 PM Eastern Time. You are encouraged to transmit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

F. INTERGOVERNMENTAL REVIEW

This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS

Cost Principles Costs must be allowable in accordance with the applicable cost principles referenced in 10 CFR part 600.

Pre-award Costs Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if such costs would be reimbursable under the agreement if incurred after the agreement is awarded. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90-day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD

Submission Method: Submit electronic applications through the "Apply for Grants" function at www.Grants.gov. If you have problems submitting your application, send an email to support@grants.gov or call 1-800-518-4726.

2. Grants.gov Registration Process

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See www.grants.gov/GetStarted). **We recommend that you start this process at least two weeks before the application due date. It may take more than 14 days to complete the entire process.** Use the Grants.gov Organization Registration Checklist at http://www.grants.gov/assets/OrganizationRegCheck.doc to guide you through the process. IMPORTANT: You must designate an E-Business Point of Contact (EBIZ POC) and this person must obtain a special password called an MPIN in the CCR registration process.

Part V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that: (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement.

2. Merit Review Criteria

Technical applications submitted in response to this announcement will be evaluated and scored in accordance with the criteria listed below:

Criterion 1: Understanding of Needs and Technical Approach – 40%

A. Demonstrated understanding of the specific needs and requirements defined in the topic area being addressed. A complete and clear description of the proposed work with respect to meeting the needs/requirements is provided.

B. Likelihood of success and innovativeness of the proposed technical approach. Extent of prior use or application of the proposed technology and appropriateness of how the prior work relates to the proposed application will be considered for assessing the likelihood of success. The degree of novel uses of existing technologies to achieve the objectives of the project will be considered for technical innovativeness.

C. Adequacy of the proposed technical approach in achieving the solicitation objectives and specific functions defined in the topic area being addressed. An adequate (qualitative and quantitative) description of how these objectives/functions will be reached and to what extent is provided.

D. Soundness and clarity of the proposed project plan, including the scope, schedule, success criteria, and the logic and sequence of work. A complete and appropriate description of the project plan in addressing potential regulatory, environmental, and economic issues is provided.

Criterion 2: Significance and Impact – 25%

A. Significance of the proposed application vs. current practices. This significance assessment will consider: understanding of deficiencies of current practices and feasibility of an applicant's technology to overcome the deficiencies; benefits in terms of anticipated performance improvements (technical, operational, and environmental aspects) and cost savings of the proposed application over current practices.

B. Impact of the proposed application on transformation of the electricity industry. This impact assessment will consider broad applicability and adaptability of the proposed application, i.e., its potential markets and its penetration rates.

Criterion 3: Capabilities of the Integrated Project Team and Key Personnel – 35%

A. Capabilities and experience of the multi-partner, integrated project team. The evaluation will consider: completeness of the representation of stakeholders on the team, with defined roles and responsibilities for each stakeholder; effectiveness of the team management structure for integration of team members' capabilities and interests to achieve the project's objectives; the team's knowledge and experience in the proposed application; and prior commercialization of developed technologies.

B. Qualifications of key personnel. The evaluation will consider: credentials, capabilities, and experience of key personnel in the related technology development, engineering, and demonstration activities being proposed; and the appropriateness of the percentage of their time that will be devoted to this project.

C. Suitability and availability of the equipment, materials, and facilities for technology development and demonstration. The evaluation will consider: reasonableness of justification for development of new equipment and apparatuses; and availability of all necessary permits for the proposed application.

3. Other Selection Factors

The selection official will consider the following program policy factors in the selection process:

1. Balanced portfolio of projects that represent a diversity of technologies and proposing entities.

2. Complementary efforts or projects, which, when taken together, will benefit a broad cross-section of the electric grid industry.

3. Geographic distribution of the projects.

4. The amount of cost share (e.g. an application with a higher cost share may be selected over an application with less cost share if there are not enough funds to fund the higher cost project.)

These factors, while not indicators of the Application's merit, e.g., technical excellence, applicant's ability, etc., may be essential to the process of selecting the application(s) that, individually or collectively, will best achieve the program objectives. Such factors are often beyond the control of the Applicant. Applicants should recognize that some very good applications may not receive an award because they do not fit within a mix of projects which maximizes the probability of achieving the DOE's overall research and

development objectives. Therefore, the Program Policy Factors may be used by the Source Selection Official (SSO) to assist in determining which of the ranked application(s) will receive DOE funding support.

The above factors will be independently considered by the SSO in determining the optimum mix of applications that will be selected for support. These policy factors will provide the SSO with the capability of developing, from the applications, a broad involvement of organizations and organizational ideas, which both enhance the overall technology research effort and upgrade the program content to meet the goals of the DOE.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance and Unsolicited Proposals." This guide is available under Financial Assistance, Regulations and Guidance at http://professionals.pr.doe.gov/ma5/ma-5web.nsf/?Open.

2. Selection

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

3. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to,: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

DOE is striving to make awards within eight months. The time interval begins on the date applications are due or the date the application is received, if there is no specified due date/deadline.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection.

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Section IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award.

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference: (1) special terms and conditions; (2) applicable program regulations, if any; (3) application as approved by DOE; (4) DOE assistance regulations at 10 CFR part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) budget summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements.

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR part 600 (See: http://ecfr.gpoaccess.gov), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation Web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements.

Special Terms and Conditions and National Policy Requirements
The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements and National Policy Assurances To Be Incorporated As Award Terms are located at http://grants.pr.doe.gov.

Intellectual Property Provisions
The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/techtrans/sipp_matrix.html.

3. Statement of Substantial Involvement.

DOE will negotiate a Statement of Substantial Involvement prior to the award of any

cooperative agreement. This statement will describe the substantial involvement anticipated between DOE and the Recipient for the project**.**

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. See Attachment A for the proposed Checklist for this program**.**

PART VII - AGENCY CONTACTS/QUESTIONS

A. QUESTIONS

1. Questions regarding the content of the announcement should be submitted through the "Submit Question" feature of the DOE Industry Interacitve Procurement System (IIPS) at http://e-center.doe.gov. Locate the program announcement on IIPS and then click on the "Submit Question" button. Enter required information. You will receive an electronic notification that your question has been answered. DOE will try to respond to a question within 3 days, unless a similar question and answer have already been posted on the Web site.

Responses to questions may be viewed through the "View Questions" feature button. If no questions have been answered, a statement to that effect will appear. You should periodically check "View Questions" for new questions and answers.

Questions regarding how to submit questions or view responses can be e-mailed to the IIPS HELP Desk at helpdesk@pr.doe.gov or by calling 1-800-683-0751.

2. Questions relating to the Grants.gov system or on how to submit an application should be directed to support@grants.gov or 1-800-518-4726.

B. AGENCY CONTACT

Name: Michael J. Rafa
E-mail: michael.rafa@ch.doe/gov
FAX: 630-252-5045

PART VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

Patentable ideas, trade secrets, proprietary or confidentional commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

"The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant."

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

"The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation."

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting

its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See "Notice of Right to Request Patent Waiver" in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to insure the commercialization of technology developed under a DOE agreement.

Special Protected Data Statutes This program is covered by a special protected data statute. The provisions of the statute provide for the protection from public disclosure, for a period of up to 5 years from the development of the information, of data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data – Programs Covered Under Special Protected Data Statutes, (10 CFR 600 Appendix A to Subpart D), would apply to an award made under this announcement. This provision will identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and will also identify data that will be recognized by the parties as protected data.

Class Waiver of Patent Rights For participant's other than those eligible to obtain title pursuant to 35 U.S.C. 202, the Government normally takes title to all inventions conceived or first actually reduced to practice under a DOE agreement. In this case, for both categories DOE anticipates issuing a class waiver that waives title to such inventions to the participant, subject to the Government's usual license, march-in, and U.S. preference provisions set out in 35 U.S.C 203 and 204. Additionally, DOE's class patent waiver will include a U.S. competitiveness provision reflecting the programmatic objectives of the program, i.e., improving the competitive position as well as U.S. employment opportunities in U.S. industries. In the event a participant, other than those eligible to obtain title pursuant to 35 U.S.C. 202, does not participate in subsequent phases of this project the remaining participants shall retain as a minimum, a royalty-free, nonexclusive license throughout the world, with the right to grant sublicenses in each subject invention held by such participant pursuant to the class waiver, except as otherwise approved by Field Patent Counsel.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

I. PARTICIPATION BY FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER (FFRDC) CONTRACTORS

Federally Funded Research and Development Center (FFRDC) contractors are not eligible for an award under this announcement, but they may be proposed as a team member subject to the following guidelines:

Authorization for non-DOE/NNSA FFRDCs The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award and must not place the FFRDC contractor in direct competition with the private sector.

Authorization for DOE/NNSA FFRDCs The cognizant contracting officer must authorize in writing the use of a DOE/NNSA FFRDC contractor on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization.

"Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complimentary to the missions of the laboratory, will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory, and will not place the laboratory in direct competition with the domestic private sector."

The contractual arrangement between the recipient and the FFRDC may be a Cooperative Research and Development Agreement (CRADA) or other agreement, to be negotiated

between the laboratory and the recipient of a cooperative agreement awarded as a result of this announcement. In any event, DOE shall pay for the laboratory's portion of the work directly and not through the recipient. (It should be noted that the total value of this solicitation will be reduced by the amount of funding sent directly to the FFRDC.)

Cost Share The applicant's cost share requirement will be based on the total cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

FFRDC Contractor Effort: The FFRDC contractor effort, in aggregate, shall not exceed 50% of the total estimated cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

Responsibility The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC contractor.

ATTACHMENT A

Federal Assistance Reporting Checklist

DOE F 4600.2
(12/04)
All Other Editions Are Obsolete

U.S. Department of Energy
FEDERAL ASSISTANCE REPORTING CHECKLIST AND INSTRUCTIONS

Attachment A

1. Identification Number:	2. Program/Project Title:
3. Recipient:	

4. Reporting Requirements:	Frequency	No. of Copies	Addressees
MANAGEMENT REPORTING			
☒ Progress Report	Q	1,1	1,2
☒ Special Status Report	A	1,1	1,2 See Addresses Below
SCIENTIFIC/TECHNICAL REPORTING			
(Reports/Products must be submitted with appropriate DOE F 241. The 241 forms are available at www.osti.gov/elink.)			
Report/Product — Form			
☒ Final Scientific/Technical Report — DOE F 241.3	F		
☐ Conference papers/proceedings* — DOE F 241.3			
☐ Software/Manual — DOE F 241.4			
☒ Other (see Special Instructions) — DOE F 241.3	A See Note 5a	1,1	1,2 See Addresses Below
** Scientific and technical conferences only*			
FINANCIAL REPORTING			
☐ SF-269, Financial Status Report			
☒ SF-269A, Financial Status Report (Short Form)	F See Note 5b	2	See NFAA Block 12
☒ SF-272, Federal Cash Transactions Report	Q See Note 5c	2	See Note 5c
CLOSEOUT REPORTING			
☒ Patent Certification	F	2	See NFAA Block 12
☒ Property Certification	F	2	See NFAA Block 12
☐ Other (see Special Instructions)			
OTHER REPORTING			
☐ Other (see Special Instructions)			

FREQUENCY CODES AND DUE DATES:

- A - Within 5 calendar days after events or as specified.
- F - Final; 90 calendar days after expiration or termination of the award.
- Y - Yearly; 90 days after the end of the reporting period.
- S - Semiannually; within 30 days after end of reporting period.
- Q - Quarterly; within 30 days after end of the reporting period.

5. Special Instructions:

a. Other: Includes, reports, reprints, conference papers, and presentation materials from all review meetings etc.

b. Financial Status Report (FSR) (SF-269A): When the recipient receives payment via the Department of Treasury Automated Standard Application for Payments System (ASAP), an SF-269A or a statement of the final federal share of costs incurred, in any format, is required. When the recipient receives reimbursement payment via SF-270, the SF-270 satisfies the FSR reporting requirement.

c. Federal Cash Transactions Report (SF-272): A Federal Cash Transactions Report is required to be submitted 30 calendar days following the end of each quarter when the recipient receives payment by ASAP. Reports should be submitted to: U.S. Department of Energy, Chicago Office, ATTN: ACCOUNTING AND FINANCE (CRA), 9800 South Cass Avenue, Argonne, IL, 60439.

ADDRESSES:

(1) To be determined

(2) To be determined

Federal Assistance Reporting Instructions (12/04)

I. MANAGEMENT REPORTING

Progress Report

The Progress Report must provide a concise narrative assessment of the status of work and include the following information and any other information identified under Special Instructions on the Federal Assistance Reporting Checklist:

1. The DOE award number and name of the recipient.

2. The project title and name of the project director/principal investigator.

3. Date of report and period covered by the report.

4. A comparison of the actual accomplishments with the goals and objectives established for the period and reasons why the established goals were not met.

5. A discussion of what was accomplished under these goals during this reporting period, including major activities, significant results, major findings or conclusions, key outcomes or other achievements. This section should not contain any proprietary data or other information not subject to public release. If such information is important to reporting progress, do not include the information, but include a note in the report advising the reader to contact the Principal Investigator or the Project Director for further information.

6. Cost Status **(NOTE: <u>Not</u> applicable to research or conference awards issued under 10 CFR Part 605)**. Show approved budget by budget period and actual costs incurred. If cost sharing is required break out by DOE share, recipient share, and total costs.

7. Schedule Status **(NOTE: <u>Not</u> applicable to research or conference awards issued under 10 CFR Part 605)**. List milestones, anticipated completion dates and actual completion dates. If you submitted a project management plan with your application, you must use this plan to report schedule and budget variance. You may use your own project management system to provide this information.

8. Any changes in approach or aims and reasons for change. Remember significant changes to the objectives and scope require prior approval by the contracting officer.

9. Actual or anticipated problems or delays and actions taken or planned to resolve them.

10. Any absence or changes of key personnel or changes in consortium/teaming arrangement.

11. A description of any product produced or technology transfer activities accomplished during this reporting period, such as:

    A. Publications (list journal name, volume, issue); conference papers; or other public releases of results. Attach or send copies of public releases to the DOE Project Officer identified in Block 11 of the Notice of Financial Assistance Award.

    B. Web site or other Internet sites that reflect the results of this project.

    C. Networks or collaborations fostered.

    D. Technologies/Techniques.

    E. Inventions/Patent Applications.

    F. Other products, such as data or databases, physical collections, audio or video, software or netware, models, educational aid or curricula, instruments or equipment.

Special Status Report

The recipient must report the following events by e-mail as soon as possible after they occur:

1. Developments that have a significant favorable impact on the project.

2. Problems, delays, or adverse conditions which materially impair the recipient's ability to meet the objectives of the award or which may require DOE to respond to questions relating to such events from the public. For example, the recipient must report any of the following incidents and include the anticipated impact and remedial action to be taken to correct or resolve the problem/condition:

    a. Any single fatality or injuries requiring hospitalization of five or more individuals.

    b. Any significant environmental permit violation.

    c. Any verbal or written Notice of Violation

of any Environmental, Safety, and Health statutes or regulations.

d. Any incident which causes a significant process or hazard control system failure.

e. Any event which is anticipated to cause a significant schedule slippage or cost increase.

f. Any damage to Government-owned equipment in excess of $50,000.

g. Any other incident that has the potential for high visibility in the media.

II. SCIENTIFIC/TECHNICAL REPORTS

Final Scientific/Technical Report

Content. The final scientific/technical report must include the following information and any other information identified under Special Instructions on the Federal Assistance Reporting Checklist:

1. Identify the DOE award number; name of recipient; project title; name of project director/principal investigator; and consortium/teaming members.

2. Display prominently on the cover of the report any authorized distribution limitation notices, such as patentable material or protected data. Reports delivered without such notices may be deemed to have been furnished with unlimited rights, and the Government assumes no liability for the disclosure, use or reproduction of such reports.

3. Provide an executive summary, which includes a discussion of 1) how the research adds to the understanding of the area investigated; 2) the technical effectiveness and economic feasibility of the methods or techniques investigated or demonstrated; or 3) how the project is otherwise of benefit to the public. The discussion should be a minimum of one paragraph and written in terms understandable by an educated layman.

4. Provide a comparison of the actual accomplishments with the goals and objectives of the project.

5. Summarize project activities for the entire period of funding, including original hypotheses, approaches used, problems encountered and departure from planned methodology, and an assessment of their impact on the project results. Include, if applicable, facts, figures, analyses, and assumptions used during the life of the project to support the conclusions.

6. Identify products developed under the award and technology transfer activities, such as:

   a. Publications (list journal name, volume, issue), conference papers, or other public releases of results. If not provided previously, attach or send copies of any public releases to the DOE Project Officer identified in Block 11 of the Notice of Financial Assistance Award;

   b. Web site or other Internet sites that reflect the results of this project;

   c. Networks or collaborations fostered;

   d. Technologies/Techniques;

   e. Inventions/Patent Applications, licensing agreements; and

   f. Other products, such as data or databases, physical collections, audio or video, software or netware, models, educational aid or curricula, instruments or equipment.

7. For projects involving computer modeling, provide the following information with the final report:

   a. Model description, key assumptions, version, source and intended use;

   b. Performance criteria for the model related to the intended use;

   c. Test results to demonstrate the model performance criteria were met (e.g., code verification/validation, sensitivity analyses, history matching with lab or field data, as appropriate);

   d. Theory behind the model, expressed in non-mathematical terms;

   e. Mathematics to be used, including formulas and calculation methods;

   f. Whether or not the theory and mathematical algorithms were peer reviewed, and, if so, include a summary of theoretical strengths and weaknesses;

   g. Hardware requirements; and

   h. Documentation (e.g., users guide, model code).

Electronic Submission. The final scientific/technical report must be submitted electronically via the DOE Energy Link System (E-Link) at http://www.osti.gov/elink-2413.

Electronic Format. Reports must be submitted in the ADOBE PORTABLE DOCUMENT FORMAT (PDF) and be one integrated PDF file that contains all text, tables, diagrams, photographs, schematic, graphs, and charts. Materials, such as prints, videos, and books, that are essential to the report but cannot be submitted electronically, should be sent to the DOE Award Administrator at the address listed in Block 12 of the Notice of Financial Assistance Award.

Submittal Form. The report must be accompanied by a completed electronic version of DOE Form 241.3, "U.S. Department of Energy (DOE), Announcement of Scientific and Technical Information (STI)." You can complete, upload, and submit the DOE F.241.3 online via E-Link. You are encouraged not to submit patentable material or protected data in these reports, but if there is such material or data in the report, you must: (1) clearly identify patentable or protected data on each page of the report; (2) identify such material on the cover of the report; and (3) mark the appropriate block in Section K of the DOE F 241.3. Reports must not contain any limited rights data (proprietary data), classified information, information subject to export control classification, or other information not subject to release. Protected data is specific technical data, first produced in the performance of the award that is protected from public release for a period of time by the terms of the award agreement.

Conference Papers/Proceedings

Content. The recipient must submit a copy of any conference papers/proceedings, with the following information: (1) Name of conference; (2) Location of conference; (3) Date of conference; and (4) Conference sponsor.

Electronic Submission. Scientific/technical conference paper/proceedings must be submitted electronically-via the DOE Energy Link System (E-Link) at http://www.osti.gov/elink-2413. Non-scientific/technical conference papers/proceedings must be sent to the URL listed on the Reporting Checklist.

Electronic Format. Conference papers/proceedings must be submitted in the ADOBE PORTABLE DOCUMENT FORMAT (PDF) and be one integrated PDF file that contains all text, tables, diagrams, photographs, schematic, graphs, and charts. If the proceedings cannot be submitted electronically, they should be sent to the DOE Award Administrator at the address listed in Block 12 of the Notice of Financial Assistance Award.

Submittal Form. Scientific/technical conference papers/proceedings must be accompanied by a completed DOE Form 241.3. The form and instructions are available on E-Link at http://www.osti.gov/elink-2413. This form is not required for non-scientific or non-technical conference papers or proceedings.

Software/Manual

Content. Unless otherwise specified in the award, the following must be delivered: source code, the executable object code and the minimum support documentation needed by a competent user to understand and use the software and to be able to modify the software in subsequent development efforts.

Submission. Software/manual submissions must be sent to the DOE Award Administrator identified in Block 12 of the Notice of Financial Assistance Award. All software/manual submissions must be furnished on a CD-ROM, 3.5 "floppy disk", or zip disk.

Submittal Form. Each software deliverable and its manual must be accompanied by a completed DOE Form 241.4 "Announcement of U.S. Department of Energy Computer Software." The form and instructions are available on E-Link at http://www.osti.gov/estsc/doef2414.pdf.

III. FINANCIAL REPORTING

Recipients must complete the financial reports identified on the Reporting Checklist in accordance with the report instructions. These standard forms are available at http://www.whitehouse.gov/omb/grants/index.html. Fillable forms are available at http://grants.pr.doe.gov.

IV. CLOSEOUT REPORTS

Final Invention and Patent Report

The recipient must provide a DOE Form 2050.11, "PATENT CERTIFICATION." This form is available at http://www.directives.doe.gov/pdfs/forms/2050-11.pdf and http://grants.pr.doe.gov.

Property Certification

The recipient must provide the Property Certification, including the required inventories of non-exempt property, located at http://grants.pr.doe.gov.